

February 17, 1982

MEMORANDUM

Calsilite Pipe Covering and Block

1. Product Formulation

Ruberoid's efforts to develop calcium silicate insulation were initiated by Ruberoid President Herbert Abraham in the early 1940's. His goal was to develop a product similar to 85% Magnesia -- at that time the principal thermal insulation material for piping and pressure vessels -- which would be able to withstand temperatures of up to 600° F., rather than the 200° F. or so that Magnesia could withstand.

Although some "paper" research was done between 1943 and 1945, it was not until 1946 that a portion of Ruberoid's existing plant in Gloucester was dedicated to Calsilite research and development. From 1946 until 1949 Calsilite was classified as a "research project." Although there presumably was some production of Calsilite during this period, there is nothing to confirm that this production was anything other than either (1) experimental or developmental or (2) for inventory-building purposes.

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At best, any production or sale of the product prior to 1949 was minimal. For one thing, prior to 1949 there were only a few molds in which to pour the slurry to make the pipe covering.^{*/} More important, a successful Calsilite formula was not developed until the end of May 1948. The basic Calsilite formula contained 13% asbestos which, after 1954, was composed of a blend of amosite fiber, Canadian 4T fiber and Canadian 3R fiber. The other ingredients in Calsilite, in their approximate percentages, were as follows:

Pulverized Quicklime	23.47%
Silica Sand	30.23%
P.H. Dolomite	2.19%
Celite F.C.	10.57%
Magnesium Sulphate	2.96%
Bentonite	5.00%
Calsilite Waste	14.25%

2. Period of Manufacture

Calsilite was manufactured on a "commercial basis" from March 7, 1949, until October 1971, when the plant was closed.

^{*/} From 1949 until 1964, Ruberoid used a "pan molding" process, which involved pouring Calsilite slurry into a 3-foot long mold for a given pipe size and putting the mold into an autoclave, where a chemical reaction took place. The pan molding process resulted in substantial breakage and an inconsistent product. The Filter Press process, put into operation in 1964, improved results on both scores.

Prior to March 7, 1949, Calsilite was classified by Ruberoid as a "research project." There was thus no use at all of Calsilite during World War II, since the product did not even exist in the laboratory until 1946.

3. Non-Asbestos Calsilite

In 1969, GAF began developing, and later perfected, a Calsilite product that did not contain asbestos, at least partly at the urging of some government agencies and departments. The development of non-asbestos Calsilite was a closely-guarded secret and few people at GAF were aware of the progress toward non-asbestos Calsilite. In the asbestos-free product, sulphite pulp was substituted for asbestos. The resulting product met all criteria of federal, military and industry standards, except for weight loss during heat soaking. The Government, however, refused to place the non-asbestos product on its "Qualified Product List," and GAF thereupon determined to close the Calsilite operation.

4. Sale of the Calsilite Plant

About a year after its closing, the Calsilite plant, equipment, patents, tradename and records were sold to a group which planned to continue manufacture of the non-asbestos product. The equipment was moved to Brunswick, Georgia, and two former GAF executives, Richard Henry and Reed Hughes, went to

Brunswick to start the operation. After several years' delay, the plant has become operational. It is now owned by a division of Dresser Industries, a major oil tool manufacturer and supplier. Only non-asbestos Calsilite is manufactured.

Paul A. Zevnik

7. Non-Asbestos Calsilite

In 1969, GAF began developing, and later perfected, a Calsilite product that did not contain asbestos, at least partly at the urging of some government agencies and departments. The development of non-asbestos Calsilite was a closely-guarded secret and few people at GAF were aware of the progress toward non-asbestos Calsilite, outside of the Quality Control Laboratory. In non-asbestos Calsilite, sulphite pulp was substituted for asbestos. The resulting product met all criteria of federal, military and industry standards, except for weight loss during heat soaking.^{13/}

In 1970 and 1971, William Schwingen and Richard Henry attempted to obtain Navy approval of GAF's non-asbestos Calsilite for use on the Navy's ships. GAF demonstrated the product's safety and suitability and even had an independent laboratory perform tests for the Navy's benefit. However, the Navy, through the Naval Experimental Station in Annapolis, refused to adjust the weight-loss-during-heat-soaking criterion, and rejected non-

^{13/} Naturally, organic material such as sulphite would not experience the same weight loss during heat soaking as would inorganic material. Weight loss during heat soaking, however, did not affect insulating ability.

asbestos Calsilite. Thus, the Navy in effect required the use of asbestos in pipe covering and lagging as late as 1971.^{14/}

The Navy's rejection of non-asbestos Calsilite came at the same time another arm of the Navy -- the Naval Ship Engineering Center in Philadelphia -- was attempting to obtain non-asbestos products for use on the Navy's ships. An astonishing letter, dated May 5, 1969, addressed to GAF, provides a frank discussion of the asbestos problem, as well as revelation of the late date upon which the Navy's concern for the use of asbestos seems to have developed. The three-page letter begins as follows:

"The serious hazards of asbestos have recently received widespread publicity and have generated a high level of interest concerning its use by the U.S. Navy as an insulating material. There are many varied uses of asbestos in the Navy but the most disturbing, from a health hazard viewpoint, is that for piping and boiler insulation and lagging. The chief hazard exists wherever there is a possibility of dust evolution during operations such as fabrication, installation and especially during rip-out.

"In order to minimize the hazards associated with the use of asbestos and therefore reduce the possibility of deleterious effects to the workers, a comprehensive study has been initiated by the Naval Ship Engineering Center, Hyattsville, Md., to investigate the feasibility of substituting alternate materials for asbestos used as lagging, piping and boiler insulation."^{15/}

Nevertheless, after GAF successfully developed a non-asbestos product in response to such concerns, it was rejected.

^{14/} A file of 75 or so GAF documents confirms this result.

^{15/} The letter is attached as Exhibit B.

Without Navy approval of the non-asbestos product, GAF determined to cease manufacturing Calsilite, and closing of the Calsilite plant was announced by GAF on October 14, 1971.

8. Sale of the Calsilite Plant

About a year after its closing, the Calsilite plant, equipment, patents, tradename and records were sold to a group headed by George W. E. Foster, which planned to continue manufacture of the non-asbestos product. The equipment was moved to Brunswick, Georgia, and two former GAF executives, Richard Henry and Reed Hughes, went to Brunswick to start the operation. After some delay, the plant apparently became operational, and was successful enough to have been purchased by Dresser Industries, a major oil tool manufacturer and supplier. It is now known as Calsilite Insulation, Inc., a Division of Dresser Industries. Henry has since died, but Hughes is still with the operation.

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